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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,925	10/10/2001	Masaki Hiraga	13780	4631

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Dowell & Dowell, P.C.
Suite 309
1215 Jefferson Davis Highway
Arlington, VA 22202

EXAMINER	
NGUYEN, KIMBINH T	
ART UNIT	**PAPER NUMBER**
2671	

DATE MAILED: 08/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/972,925	HIRAGA, MASAKI	
	Examiner	Art Unit	
	Kimbinh T. Nguyen	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to amendment filed 08/11/04.

2. Claims 1-33 are pending in the application.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

3. Claims 30 and 31 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 1 and 27. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 5-7, 10-15, 18, 23-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Shinagawa et al. (6,323,863).

Claims 1, 23 and 30, Shinagawa et al. discloses obtaining a description of a surface of an object (describing an object by surface elements called parametric patches; col. 2, lines 10-14); defining an origin on the surface (col. 3, lines 36-40; col. 15, lines 56-59); decomposing the surface into a plurality of independent shape components (object surface can be divided into pieces; col. 15, lines 42-44) according to a distance from the origin a point the surface (the connection between singular points, between nodes; col. 15, lines 31-44); and encoding the shape components (surface encoding; col. 15, lines 19-30.

Claims 2, 24 and 28, Shinagawa et al. discloses the description takes form polygon mesh (col. 3, lines 10-14), the origin is a predefined base vertex in the polygon mesh (col. 3, lines 36-40), and the distance is a graph distance from the base vertex to a vertex of the polygon mesh (obtaining polygon data; obtaining connection information between the singular points...; col. 3, lines 43-45; col. 19, lines 44-46).

Claim 3, Shinagawa et al. discloses shape components include a contour graph which is a set of edges that connect between vertices that have the same graph distance (col. 21, lines 1-16).

Claim 5, Shinagawa et al. discloses the base vertex plurality of base vertices and the graph distance of a specific vertex is defined as a minimum value of the graph distances from the plurality of base vertices to the specific vertex (the distances between contours are closest to each other; col. 20, lines 41-46).

Claims 6 and 7, Shinagawa et al. discloses the shape components include an annulus (fig. 2a); the shape components include two-dimensional cell (fig. 1).

Claims 10 and 11, Shinagawa et al. discloses the two-dimensional cell, the annulus is an independent region (col. 18, lines 39-46), only one boundary of which connects between vertices with a graph distance m, m+1, where m is a natural number (the indices and connection information between singular points; col. 17, lines 45 through col. 18, line 58).

Claims 12-14, 25, Shinagawa et al. discloses shape components include global topological information of the object (col. 16, lines38-45); the global topological information is specified by a structural graph obtained on a basis of the graph distance (the connection between singular points); the structural graph is a Reeb graph known in differential topology (col. 8, lines 8-22; col. 15, lines 31-40).

Claims 15 and 26, Shinagawa et al. discloses encoding the shape components includes encoding geometrical information of the object (encoding based on Morse function or Morse theory; col. 15, lines 18-20); and encoding local topological information of the object (a manifold can be constructed by cells; col. 15, lines 19-30).

Claim 18, Shinagawa et al. discloses encoding the geometrical information adapts to a local size of the polygon mesh (small in size of the topological data; col. 22, lines 1-8).

Claims 27 and 31, Shinagawa et al. discloses obtaining an object (col. 3, lines 49-50); defining a function on a distance on a surface of the object (Morse function; col. 3, lines 50-51); obtaining a structural graph of the object on a basis of a value of the function (skeleton graph; col. 3, lines 25-29); and encoding the object such a form that the structural graph is included (col. 15, lines 19-29).

Claim 29, Shinagawa et al. discloses the structural graph represents a critical point of the function as a node (col. 16, lines 14-16).

Claims 32 and 33, Shinagawa et al. discloses an obtaining unit which obtains encoded data of an object (obtain polygon data; fig. 19, #S10, #S13); an extracting unit which extracts a plurality of independent shape components from the encoded data (extract topological information; fig. 17, # S1; fig. 29), wherein said plurality of independent shape components were encoded after being decomposed according to a distance from an origin of the surface (object surface can be divided into pieces; col. 15, lines 42-44), which is included in the encoded data, to point the surface the object (the connection between singular points, between nodes; col. 15, lines 31-44); a decoding unit which decodes each of the extracted shape components and reconstructs geometry and topology information of the object (data editing apparatus; fig. 30); and an output unit (rendering unit) which outputs a decoded representation of the object (display apparatus; fig. 30).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shinagawa et al. (6,323,863) in view of Gueziec et al. (6,031,548).

Claim 4, Gueziec et al. discloses ensuring that a closed surface (boundary curve) by applying an Euler equation to a contour node and a contour edge which are extracted from the contour graph (col. 4, lines 13-20) . It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate an Euler equation taught by Gueziec into the graph structure generation of Shinagawa for encoding the topological information, because it would provide a computer data structure of representing a multi-level progressive representation of a triangle mesh (col. 3, lines 45-46).

8. Claims 8, 9, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinagawa et al. (6,323,863) in view of Rossignac et al. (5,905,507).

Claims 8 and 9, Rossignac et al. teaches the annulus takes the form of a triangle strip; the two-dimensional cell takes the form of a triangle strip (col. 2, lines 40-61).

Claims 16 and 17, Rossignac et al. discloses encoding the local topological information includes a description indicating that the object polygon is a non-manifold

when a shape represented by the polygon mesh is a non-manifold; the description describes around a vertex that the number of sets of polygons (a vertex of triangle mesh) characterizes the non-manifold (col. 4, lines 47-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the triangle strip and non-manifold description as taught by Rossignac into the graph structure generation of Shinagawa for encoding the topological information, because it would improve system and method for representing the connectively information (topological information) of any triangle mesh (col. 5, lines 48-50).

9. Claims 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinagawa et al. (6,323,863) in view of Li et al. (6,262,737).

Claim 19, Li et al. discloses encoding the geometrical information is performed through an entropy coding of a difference between a predicted value and a real value of the geometrical information to be encoded (col. 2, lines 35-42; col. 6, lines 47-56).

Claim 20, Li et al. discloses adjusting the difference to optimize the entropy coding (removing the redundancy of geometrical data via prediction; col. 6, lines 22-30).

Claim 21, Li et al. discloses the adjusting includes: assigning an allowance range to the real value (ranging from the coarsest approximation to the finest replica; col. 13, lines 1-2); allowance range to minimize an amount of the encoded difference between the predicted value and the reference value (col. 6, line 46 through col. 8, line 12); and replacing the difference between the predicted value and the real value by the detecting a reference value within the difference between the predicted value and the reference value (col. 8, lines 15-43; col. 10, lines 19-21).

Claim 22, Li et al. discloses the allowance range is defined by adapting to the size of the polygon mesh relating to the geometrical information to be encoded (col. 8, lines 38-43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate data prediction and entropy coding taught by Li into the graph structure generation of Shinagawa for encoding the topological information, because applying data prediction and entropy coding, it would provide the finest granularity for simplification or refinement (col. 11, lines 41-45).

Response to Arguments

10. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimbinh T. Nguyen whose telephone number is (571) 272-7644. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Friday from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached at (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 16, 2005

KIMBINH T. NGUYEN
PRIMARY EXAMINER